



Factors influencing dogs' stress level in the waiting room at a veterinary clinic

*Faktorer som påverkar hundars stressnivå
i väntrummet på en veterinärklinik*

Louise Hernander



Sveriges Lantbruksuniversitet
Institutionen för husdjurens miljö och hälsa
Etologi och Djurskyddsprogrammet

Skara 2008

Studentarbete 190

*Swedish University of Agricultural Sciences
Department of Animal Environment and Health
Ethology and Animal Welfare programme*

Student report 190

ISSN 1652-280X

**Factors influencing dogs' stress level
in the waiting room at a veterinary clinic**

*Faktorer som påverkar hundars stressnivå
i väntrummet på en veterinärklinik*

Louise Hernander

Exam paper, 15 hp, Etologi och Djurskyddsprogrammet

Mentor: Jenny Loberg

Sammanfattning

Totalt 110 hundar studerades i väntrummet på en veterinärklinik och deras stressnivå registrerades under tre olika händelser; entré, efter en stunds passiv väntan samt när hunden skulle vägas. Ett av syftena med studien var att undersöka om hundens kön hade någon påverkan på hundens stressrelaterade beteende i väntrummet. Könet visade sig dock inte ha någon signifikant effekt, vilket antyder att hanhundar och tikar visar samma grad av stress i väntrummet. Ett annat syfte var att undersöka om hundägarens kön hade någon påverkan på hundens stressnivå. Mellan manliga respektive kvinnliga hundägare fanns ingen signifikant skillnad, men däremot visade det sig att hundar som kom till kliniken med både en man och en kvinna hade högre stressnivå under entrén än hundar med en ensam ägare, och ett likartat resultat visade sig också under passiv väntan. Hundar som kom på återbesök hade signifikant högre stressnivå under väntetiden än hundar som var där på nybesök. Väntetidens påverkan på hundens stressnivå analyserades också och det visade sig att väntetiden är något positivt för de flesta hundar, som då får en chans att stressa ner innan mötet med veterinären. Slutligen analyserades vägningens påverkan på hundens stressnivå. Resultatet visade att de flesta hundar upplever vägningen som något obehagligt, och att det därför troligen vore att föredra att väga hundarna så snart de anmält sig i receptionen istället för att vänta tills de ropas upp för att gå till undersökningsrummet, då detta gör att hunden får en onödigt hög stressnivå inför veterinärundersökningen.

Abstract

A number of 110 dogs were observed during their whole time in the waiting room at a veterinary clinic and the dogs' stress level was recorded in three different events; entrance, wait and weighing. One of the aims of this study was to investigate if the gender of the dog had any impact on the dog's stress-related behaviour in the waiting room. This had however no significant influence, suggesting that female and male dogs show an equal amount of stress. Another goal was to establish if the gender of the dog owner influenced the dogs' stress level. No difference between male and female owners could be detected. However the result showed that dogs who is accompanied by a female and a male owner as a couple were more likely to have a higher stress level when entering the clinic than dogs accompanied by a single person, and a similar result was found with regard to the time in the waiting room. Thirdly, dogs that recently had been to the clinic had significantly higher stress value in the waiting room. Also the time in the waiting room itself was analyzed for its impact on the dogs' stress level in comparison with the stress value at the entrance, and the result showed that a vast majority of dogs displayed a decrease in stress during the wait. Finally the weighing of the dogs was analysed for its influence on the dogs' stress level compared to the stress level achieved during the wait, and it showed that a majority of dogs displayed an increase in stress during the weighing. This study suggests that the time in the waiting room is beneficial to the dogs since they get a chance to relax prior to the meeting with the veterinarian. It also suggests that it would be preferable to weigh the dogs right after the registration at the reception desk and then let the dog sit down and wait continuously until it is called up, instead of the current proceeding where the dogs is weighed just before it is time to meet the veterinarian. By taking these adjustments under consideration the welfare of the dogs in the waiting room could probably be improved by small means.

1. INTRODUCTION	5
STRESS.....	5
<i>The definition and biology of stress</i>	<i>5</i>
<i>Fear and anxiety as stressors.....</i>	<i>5</i>
<i>Pain as a stressor</i>	<i>6</i>
BEHAVIOURAL DIFFERENCES BETWEEN DOGS	7
<i>Breed differences</i>	<i>7</i>
<i>Gender differences.....</i>	<i>8</i>
<i>Age differences</i>	<i>9</i>
<i>Personality differences.....</i>	<i>9</i>
<i>The dog owner's influence on the dog's behaviour</i>	<i>10</i>
<i>The consequence of early experience.....</i>	<i>11</i>
<i>Meeting unfamiliar dogs</i>	<i>12</i>
2. PURPOSE.....	12
3. MATERIAL AND METHODS	13
<i>The conditions of the study.....</i>	<i>13</i>
<i>Statistics</i>	<i>15</i>
4. RESULTS AND DISCUSSION	15
<i>Breeds and general distribution of stress value.....</i>	<i>15</i>
<i>The gender of the dog</i>	<i>17</i>
<i>The gender of the dog owner.....</i>	<i>17</i>
<i>The dog's previous experience.....</i>	<i>20</i>
<i>Differences in stress level after the time in the waiting room.....</i>	<i>22</i>
<i>The weighing's impact on the dogs' stress value.....</i>	<i>23</i>
<i>General discussion</i>	<i>25</i>
5. REFERENCES.....	27

On the cover: The author's working kelpie male, Ramses, on the scale in the waiting room at Blå Stjärnans animal hospital

Photo: Andreas Hernander Brand

1. Introduction

Stress

The definition and biology of stress

Stress is a part of life in all life-forms and it not necessarily a bad thing. The challenge lies in distinguishing the severe stress that might influence the animal's welfare from the non-threatening everyday-life stress (Moberg, 2000). The term "stress" is widely used and no clear definition has been accepted. However, it is often defined as when an animal is suffering a threat to its homeostasis, and the threat is defined as the "stressor" (Moberg, 2000). The animal's way of responding to the stressor can be divided into four biological defence responses; the behavioural response, the autonomic response, the neuroendocrine response and the immune response (Moberg, 2000). If an animal is failing to cope with the stress, that is if the stress response gives no reduction of the amount of stress, then the animal experiences *distress* and it will decrease it's welfare (Moberg, 2000). The behavioural stress response is the biologically most economic way for an animal to handle a stressful situation, e.g. avoiding a stressor by move away from the threat (Moberg, 2000), and it is also the most relevant stress response when discussing behaviour in the waiting area at a veterinary clinic since it is difficult to measure physiological stress responses in this environment.

Stress can be related to an *external causes* such as environmental factors (temperature, humidity, space, light etc.), malnutrition or body damage, and by *internal causes* such as fear, frustration or anxiety (Wolfe, 2000). Internal factors is often difficult to diagnose, and attempts to reduce the stress by focusing for instance on environmental factors when the underlying cause is an internal factor such as fear will have little or no effect (Wolfe, 2000). There are numerous stress-related behaviours, and in a stressful environment such as a veterinary clinic the goal can't be to eliminate all these behaviours, but to reduce them and prevent a too large amount of unnecessary stress.

Fear and anxiety as stressors

Fear and anxiety is both serious stressors (Wolfe, 2000). The aim of a study performed in 1981 was to evaluate the behaviour of a number of dogs entering a veterinary clinic. The results showed that 60% of the dogs appeared anxious during the entrance (Stanford, 1981). This result ought not to be surprising to the staff of any veterinary clinic. Dealing with fearful and severely anxious dogs is an everyday matter in most veterinary practices. In fact the number of dogs displaying anxiety related problem behaviours has increased since the nineties (Bamberger & Houpt, 2006). Fear associated to a certain stimulus will cause stress to the individual whenever exposed to that stimulus (Wolfe, 2000). A person might very well be such a stimulus, for instance the dog may consider one veterinarian very frightening due to a previous negative experience with that particular veterinarian (Wolfe, 2000).

Fear is a complicated state. Fear inducing stimuli can be divided into non-social stimuli such as loud noises, traffic or novel objects, and social stimuli such as unfamiliar people or children (Diverio et al., 2008). An anxious dog often shows behavioural disturbances such as excessive licking in particular body parts, chewing on furniture and other things and is

shy and avoidant in novel situations (Diverio et al., 2008). The behaviour of a fearful dog may not always coincide with the physiological fear-related responses. Thus a dog may be more frightened than it appears to be, the heart rate and body temperature may rise due to fearfulness, despite the behaviour is barely changed (Ogata et al., 2006). A dog's heart rate may also rise due to alertness in a novel situation, thus fearless dogs might have a raised heart rate in an unfamiliar situation even though not frightened (Hydbring-Sandberg et al., 2004). There are also different types of fear and how serious these are to a dog. For instance fear of gunshots is severely stressful for the individual, whilst fear of novel situations, such as unfamiliar flooring, is less severe (Hydbring-Sandberg et al., 2004).

Breed and gender might also affect the dog's tendency to be fearful or anxious. For instance Labrador retrievers are rarely anxious, while mixed breeds are over-represented in the American statistics of anxious dogs (Bamberger & Houpt, 2006). Furthermore phobias are more common in female dogs than male dogs (Bamberger & Houpt, 2006). Fear can also induce aggression. In a study in the Netherlands, 26% of the reported cases of behaviour problems in dogs consisted of fear-motivated aggression (Galac & Knol, 1997). This type of aggression ought to be well-known to veterinarians since it is often expressed when a fearful dog is feeling crowded due to approach and touch. A dog displaying this type of aggression may snap, growl and bite just as a dog displaying other types of aggression (e.g. territorial aggression) but in general the body posture of a frightened dog is low, with the ears and tail down (Galac & Knol, 1997).

To reduce the amount of stress Dog Appeasing Pheromone (DAP) can be used in the veterinary clinic. DAP consists of a synthetic pheromone imitating that of the intermammary sebaceous glands of newly delivered bitches and this pheromone is said to have a calming effect in various situations (Pageat & Gaultier, 2003). This method was at first used to manage behavioural problems in dogs, but it has become more common as a means of reducing stress in the veterinary clinic in recent years (Pageat & Gaultier, 2003). The subject has been somewhat controversial since the extent of the effect has been unsure. One study showed that DAP significantly made the dogs more relaxed, however no change was recorded in aggressive behaviours in the examination room (Mills et al., 2006).

Pain as a stressor

Pain can be defined as a subjective, unpleasant experience usually linked to tissue damage and is a very powerful stressor (Mellor et al., 2000). Physiological measurements to detect pain in animals such as hormone levels etc. is effective, but behavioural parameters has major advantage since it is often immediate and needs no laboratory analysis (Mellor et al., 2000). A dog in pain might behave differently than it otherwise would have. Pain has shown to have a great impact on a dog's body posture, activity, mobility and vocalisation (Holton et al., 2001). A dog in pain usually has a tensed, avoiding and hunched body posture. The dog may also have a depressed and sullen attitude towards the owner and the veterinary staff. When touched it might growl, flinch, snap or bite, and might become wary of it's body parts making it difficult to handle (Holton et al., 2001).

Behavioural differences between dogs

The way an individual is responding to a stressful environment, such as the waiting room at the veterinary clinic, depends on a numerous amount of parameters like breed, age, gender, personality, previous experience, if the dog is in pain or not, the dog owner's expectancies and the appearance and behaviour of the other dog's in the room.

Breed differences

Among these parameters breed specific characteristics in temperament and behaviour plays a major role in the way a dog behave. For instance poodles and fox terriers are suggested to be generally anxious breeds (Lund et al., 1996) and greyhounds and basset hounds show low aggressiveness, whilst Jack Russell terriers and Dobermans show high aggressiveness (Notari & Goodwin, 2007). Reactivity might sometimes be associated with aggressiveness, but there are examples of breeds with high reactivity and low aggression (e.g. Labrador retriever) and low reactivity and high aggression (e.g. Rottweiler) meaning these traits do not have to be correlated (Notari & Goodwin, 2007).

In the veterinary clinic the types of aggression one could consider most relevant, except for fear-induced aggression that was mentioned before, is aggression towards unfamiliar people and towards other dogs (interdog aggression). For instance Cocker spaniels and Collies have been found to show aggression towards strangers and German shepherd dogs has been found to show interdog aggression (Lund et al., 1996). Generalisation is common regarding breed differences. German shepherds have a reputation of being hard and tough dogs, but the truth is often more complicated. Labrador retrievers, which is considered a perfect family dog by most people, in fact scores higher in courage, hardness and nerve stability, though German shepherds scores higher in sharpness and defence drive (Wilsson & Sundgren, 1997). All these traits might be considered belonging to a "tough" dog.

Svartberg (2006) found large breed differences in curiosity/fearlessness, sociability and aggressiveness when investigating 31 different breeds. However no relations between these traits and the breeds' original use were found. This suggests that modern breeding selection has affected the breed specific behaviour, and might do it even more in the future. Breeds that mainly has been selected on dog show results, showed more fearfulness, less curiosity and less aggression, whilst dogs selected on working ability showed more playfulness and more aggression (Svartberg, 2006). However no significant difference between the international breed groups established by the FCI (Fédération Cynologique Internationale – the International Kennel Club, 2008) were found, suggesting there is no uniform breed group specific behaviours. As an example the retriever breeds scored very differently in the trait curiosity/fearlessness, with top score for Labrador retriever and flat coated retriever, whilst Nova Scotia duck tolling retriever and golden retriever are in the bottom of the list (Svartberg, 2006). This suggests no generalisation can be made due to breed groups and their behaviour, at least not in these traits, but differences in behaviour due to breed is evident.

In a waiting room the breed of the dogs present might affect the atmosphere depending on their breed dependent behaviour. A waiting room with a fox terrier and a Shetland sheepdog, both active and contact seeking breeds, has a different atmosphere than a waiting room with a basenji and a beagle, both less active and avoidant breeds (Plutchik, 1971). Terriers have also been shown to be more interested in novel objects, sniffing and approaching them in a significant greater amount than basenjis and beagles (Plutchik, 1971).

Thus a terrier in a waiting room is more likely to sniff around examining the environment, when a beagle probably will show little interest of the novel surroundings.

In the veterinary clinic small puppies (8-16 weeks) of large breed dogs displays less vocalization, such as whining, than puppies of smaller breeds (Godbout et al., 2007). However at this early age they already show panting during the visit, as opposed to smaller breed puppies (Godbout et al., 2007). Different breeds might also be more or less easy to handle during physical examinations, such as examining paws and mouth. One study found that gundogs were easier to handle and utility dogs somewhat worse (Seksell et al., 1999).

Mixed breeds is rarely mentioned in studies regarding breed differences in behaviour, but one study found that mixed breeds more often suffered from separation anxiety and aggression towards strangers, than they did suffer from aggression towards their owner (Takeuchi et al., 2001).



Figure 1. This working kelpie's appearance in the waiting room will be affected by the fact that he is an intact but socially insecure male of a reactive breed, with several unpleasant previous experiences in this particular animal clinic. He is tensed, unwilling to sit down, the tail is low and his ears pulled back. Photo: Andreas Brand Hernander

Gender differences

The gender of a dog affects its behaviour in many ways. This has particularly been tested in the context of working dogs, to pick out the dogs most appropriate for the task. Traits like self-confidence, nerve stability and fighting drive differs significantly between males and females (Ruefenacht et al., 2002), and these traits might all influence a dog's behaviour in the waiting room when exposed to unfamiliar dogs and a stressful situation. In an Italian study females were considered more trainable and more affective, whilst males showed more dominance over the dog owner and more territorial aggression (Notari & Goodwin, 2007).

The fact that males show significantly more aggression towards other dogs is proved in several studies (Lund et al., 1996; Rooney & Bradshaw, 2004; Notari & Goodwin, 2007). Despite this fact, males are more often used as working dogs such as police dogs and search dogs. In a study of search dogs in the United Kingdom more than 85% of the dogs were male, even though according to the handlers, female dogs were more close to the ideal regarding aggression towards other dogs (Rooney & Bradshaw, 2004). The handlers of the female dogs were not less satisfied with their dog's work and this suggests that more female working dogs perhaps could be used with good results (Rooney & Bradshaw, 2004). In fact a study of guide dog training showed that female dogs were more likely to graduate within the established time than male dogs that more often required additional training (Ennik et al., 2006). Why males are more often used as working dogs might depend on tradition and an idea of better stamina and confidence.

To further complicate the image of gender differences one must know not all breeds display gender differences in the same way. For instance in one study German shepherd males got higher score in ability to cooperate, whilst in Labrador retrievers the females scored higher than the males for the same trait (Wilsson & Sundgren, 1997).

Female and male dogs also respond differently towards unfamiliar people. Male dogs tend to be more attentive and will study an unfamiliar person for a longer period than females who tend to relax more easily in the presence of an unknown person (Wells & Hepper, 1999). However male puppies are gentler in the interaction with veterinarians than females, even though female puppies are more passive in general in the veterinary clinic and therefore also have a lower heart rate (Godbout et al., 2007). Female puppies also strike back their ears less frequently than male puppies (Godbout et al., 2007).

Age differences

Very young puppies behave differently in the veterinary clinic than older puppies and adult dogs. For instance older puppies are less interested in interaction with the veterinarian than younger puppies (Godbout et al., 2007). Even though puppies display a wide variety of behaviours in the veterinary clinic environment, most of them behave in a similar way. Godbout and colleagues could however detect a proportion of puppies (10%) that behaved in a totally different way. These puppies for instance showed more interaction with the veterinarian, less exploratory behaviour and vocalized more. During the examination these puppies also showed more avoidance behaviour and pulled back their ears more than the other puppies. Since these behaviours are characteristic to stress this might indicate that some puppies handle the veterinary environment less well than other puppies, suggesting that even at this early age (8-16 weeks) differences in ability of coping with stress might be detected, but this could also be normal behaviour for some puppies (Godbout et al., 2007).

The dog's maturity may affect different traits in different ways. Between 6 months and 18 months of age almost no change appears in a dog's confidence, however there is a significant increase in its dominance aggression level (Goddard & Beilharz, 1985). 80% of all behaviour problem cases is reported within the dog's three first years in life (Lund et al., 1996), suggesting that the dog's personality is established within three years of age.

Personality differences

No matter which breed, age or gender a dog has, its personality will also affect its behaviour. Five different personality traits that seem to be characteristic for the dog as a

species (playfulness, chase-proneness, sociability, curiosity-fearfulness and aggressiveness) has been defined (Svartberg & Forkman, 2003). These traits have followed the dog through the domestication and are present within all dogs (Svartberg & Forkman, 2003), although parameters such as breed and individual differences cause the traits to vary in range between dogs. Establishing individual differences in the personality traits will help to assess single individual's personality and behaviour. A common way of doing this is letting the dog undergo a mental/behaviour test. However this type of tests has its limitations. One is that despite there is a large number of scientific studies of personality traits in dogs, trying to define different traits and respond to why some dogs show more or less of these traits, the results from different studies is often incomparable due to lack of standardized tests (Ogata, et al., 2006).

Another limitation is that even if the goal is to assess a dog's personality; some traits might not at all be assessed during a test of this type. As an example the test most commonly used in Sweden called "Dog Mentality Assessment" can be mentioned. It is developed by the Swedish Working Dog Association, (Svenska Brukshundsklubben, 2007) and this type of personality test is limited when it comes to establishing a dog's aggressive behaviour in everyday life and the test in fact does not predict the dog's personality according to any dog-directed behaviour (Svartberg, 2005). This suggests that a dog's full personality is difficult to predict due to test results and that no test will capture the whole personality of the dog. However, the Swedish test has proven to be very useful in assessing other traits, such as non-social fearfulness and attitude towards strangers, creating an important instrument for breeders, making it possible to detect and avoid breeding fearful dogs (Svartberg, 2005).

How consistent a personality trait is may also vary depending on the trait and the situation. Sociability and boldness/shyness tend to be very consistent traits, meaning they will not change very much over time, whilst curiosity/fearlessness and aggressiveness however is dependent on the novelty of the situation and recent experiences (Svartberg et al., 2005).

Whether a dog is bold or shy – which is a "higher dimension" personality trait connecting all other personality traits and their expression in the dog – have a great importance to the dog's personality. Bold dogs are good working dogs, they usually have confidence and reach higher competition classes at younger age (Svartberg, 2002).

The dog owner's influence on the dog's behaviour

The human-animal bond is important in veterinary medicine. Most veterinarians agree to that the bond between clients and their animals affect the way veterinarians practice their work (Martin & Taunton, 2006). In the waiting room the bond between a dog and its owner is critical since it is a stressful situation for both of them (BSAVA Congress, 2006).

It is commonly suggested that the dog owner's personality influences the dog's behaviour and temperament, and it has also been proved. In a study of Cocker spaniel owners in the United Kingdom it was shown that dogs with a higher aggressive nature were more likely to have tense, shy and emotionally instable owners than dogs with a less aggressive nature (Podberscek & Serpell, 1997). There is also a correlation between owners who tend to be involved with their dog in an anthropomorphic way and the dog displaying dominance aggression (O'Farrell, 1997). Over-excited dogs and dogs with a large amount of displacement activities are also more likely to have anxious owners (O'Farrell, 1997).

The dog owner may also affect the dog's behaviour due to lack of experience. A study from Denmark showed that dogs with young owners were more likely to display aggression towards other dogs (Rugbjerg et al., 2003). Also dog owners that had little or no knowledge of the breed of their dog before obtaining it was more likely to have a dog with interdog aggressive behaviour.

The dog owner's gender may also have an influence on the dog's behaviour and their relationship since dogs show more defensive aggression towards males than females (Wells & Hepper, 1999). Even if males and females behave in the exact same way, dogs tend to be more apprehensive towards males than females, suggesting the physical appearance of males in itself, perhaps due to body size, odour etc., is more threatening than that of females (Wells & Hepper, 1999).

Dog owners also seem differently motivated to solve behavioural problems, depending on the character of the problem. Owners with dogs displaying aggression towards their owner as well as aggression towards strangers tend to seek help a lot earlier, than owners with dogs displaying separation anxiety (Takeuchi et al., 2001), perhaps indicating attitude differences to the seriousness of the problem. The same study also showed that owners to dogs with separation anxiety indulged their dogs, the dogs were little trained and did not obey commands very well. Dogs' skill to independently solve problems has also been studied and it showed that dogs who failed in their ability to solve problems had a stronger attachment level to their owner (Topál et al., 1997). This indicates that a strong relationship with the dog owner is somewhat handicapping for the dog in situations where it needs to act independently.

The consequence of early experience

Learning is a never-ending occurrence in life. As a matter of fact all experiences and stimuli have the potential of being memorized and therefore affect succeeding behaviour (Broom & Johnson, 1993). If a dog experiences a negative event caused by a human, for instance by the staff in the veterinary clinic, the dog might be more difficult for the personnel to handle and the handling will be even more disturbing to the dog in the future, creating a viscous circle (Broom & Johnson, 1993). Therefore, introducing veterinary handling procedures, such as examining mouth and paws, to young puppies to make them more relaxed while handled in this type of situations might seem like a self-evident good idea. However, an Australian study showed no difference in how easy the puppies were to handle with regard to their previous experience of such handling (Seksel et al., 1999). It is suggested that aversion to veterinary handling becomes more evident later in the dog's maturation and that socialisation with veterinary procedures therefore might be more useful later in the young dog's development (Seksel et al., 1999).

Most scientists seem to agree on the fact that the puppy's early experiences in life are of great importance to the further development of the individual and it's personality. Puppies that were raised in a maternal non-domestic environment, and with limited experience of urban environments during 3-6 months of age was significantly more suspicious towards unfamiliar people and showed more avoidance behaviour than other dogs (Appleby et al., 2002). Also aggression towards veterinarians and in the veterinary hospital environment was significantly more likely in dogs raised in a non-domestic environment (Appleby et al., 2002) Furthermore puppies first acquired at an age of seven months has shown to be more likely to develop separation anxiety problems than puppies acquired at 10-15 weeks (Takeuchi et al., 2001). This suggests that puppies obtained late are more likely to become too dependent on their owner.

Meeting unfamiliar dogs

It is inevitable for unfamiliar dogs to meet in the waiting room at a veterinary clinic. But how stressful for the dogs is this kind of meetings? A study of so-called dog parks, an area where the dogs can be let loose and run freely together with other dogs, showed that aggression between unfamiliar dogs at neutral ground such as this is rare, and mainly depends on very few aggressive individuals in particular (Shyan et al., 2003). In a waiting room where the dogs rarely are disposed to each other in a way that enables physical contact this problem ought to be even smaller. Aggression might not however be the only problem. For instance a bitch in oestrus may cause a lot of stress to the male dogs in the room, and aggression between males also increases when a bitch in oestrus is present (Pal et al., 1999). In fact even neutered males may display sexual aggression towards other males over a female in oestrus (Le Boeuf, 1970).

The way a dog reacts in a meeting with an unfamiliar dog depends on its personality, maturity and the personality of the other dog. A dog with great confidence and yet low dominance aggression will wag its tail and be less likely to bite, than a dog with low confidence and great dominance aggression (Goddard & Beilharz, 1985). The gender is also important for the way the dogs will behave since female dogs is more aggressive towards other females and males is more aggressive towards other males, even neutered males is more aggressive towards other males (Goddard & Beilharz, 1985).

In 1999 a patent application for animal separators especially designed for waiting rooms at the veterinary clinics was posted to the United States Patent and Trademark Office. The inventor was Anna Crispino Pisa and the purpose was to create a comfortable resting space where the dogs and their owners would be separated from the other dogs in the room by a board or wall, optionally fully covered or with visual contact with the dogs nearby (USPTO, 1999). However, this invention has not found its way to Sweden, and it doesn't seem established in the United States either, since I've found no company distributing the product and no veterinary clinic that has invested in the idea.

2. Purpose

The aim of this paper was to investigate the prevalence of stress-related behaviour in dogs in the waiting room at a veterinary clinic. The goal was also to determine whether a number of parameters had any influence on the dog's stress level and if the time in the waiting room itself influenced the stress level over time. Also the dog's approach to the scale and its stress-related behaviour in conjunction to the weighing was evaluated.

The questions that were investigated:

- Does the dog's gender influences its stress level?
- Does the dog owner's gender influence the dog's stress level?
- Has the dog's previous experience any influence on its stress level?
- Will the stress level change due to the time in the waiting room?
- Will the weighing procedure affect the dog's stress level?

3. Material and methods

A total number of 118 dogs were observed in the waiting room at Blå Stjärnans veterinary clinic in the town of Skara in Sweden. Each dog's stress level was classified according to a scale based upon the dogs' appearance and behaviour (Table 1). The stress level was recorded at three different events;

ENTR: The dog enters the waiting room from outside the parking lot

WAIT: During the passive waiting in the seating area

SCALE: The dog is to be weighed on the scale

The dogs that were weighed got three different values (ENTR, WAIT, SCALE). However not all dogs were weighed, therefore some dogs only got two different values (ENTR, WAIT). Each value is ranging from 1-5, depending on the dog's behaviour.

Table 1. Classification of stress level based upon the dog's behaviour

Stress value	The dog's behaviour/appearance
1	Calm, relaxed, seemingly unmoved.
2	Alert, but calm, cooperative.
3	Tensed, but cooperative, panting slowly, not very relaxed, easily led in the leash.
4	Obviously very tensed, anxious, shaking, whining, will not sit/lie down, panting intensely, difficult to maneuver in the leash.
5	Extremely stressed, barking/howling, tries to hide, needs to be lifted up or to be brutally forced when pulled in the leash.

The conditions of the study

The waiting room at the actual clinic was spacious and bright owing to big windows and good lighting (Fig. 2-3). The entrance was located in the middle of the long side of the room, which made the dogs to enter in the middle of the room. The reception desk was placed straight ahead of the entrance, slightly to the left, which meant that each dog that came in immediately crossed the room to get to the reception desk. The scale was placed near the desk at the left side, just by the corridor to the examination rooms. It was of a regular model used in veterinary clinics, that is a rectangular platform with a non-slippery surface placed directly on the floor, creating a small step-up from the floor. No pheromones (DAP) were used in the clinic during the time of the study.

The observer was placed at the left short side of the room (marked with an "*" in Fig. 3) where a good overview of the whole waiting room, including the entrance, scale and all the seating, was possible. During an observation period (on average 3 hours sessions) all the dogs entering the room was followed until they were called to the examination rooms, no



Figure 2. The actual waiting room area at Blå Stjärnans animal hospital, picture taken from the corridor to the examination rooms (see Fig. 3). Photo: Andreas Hernander Brand

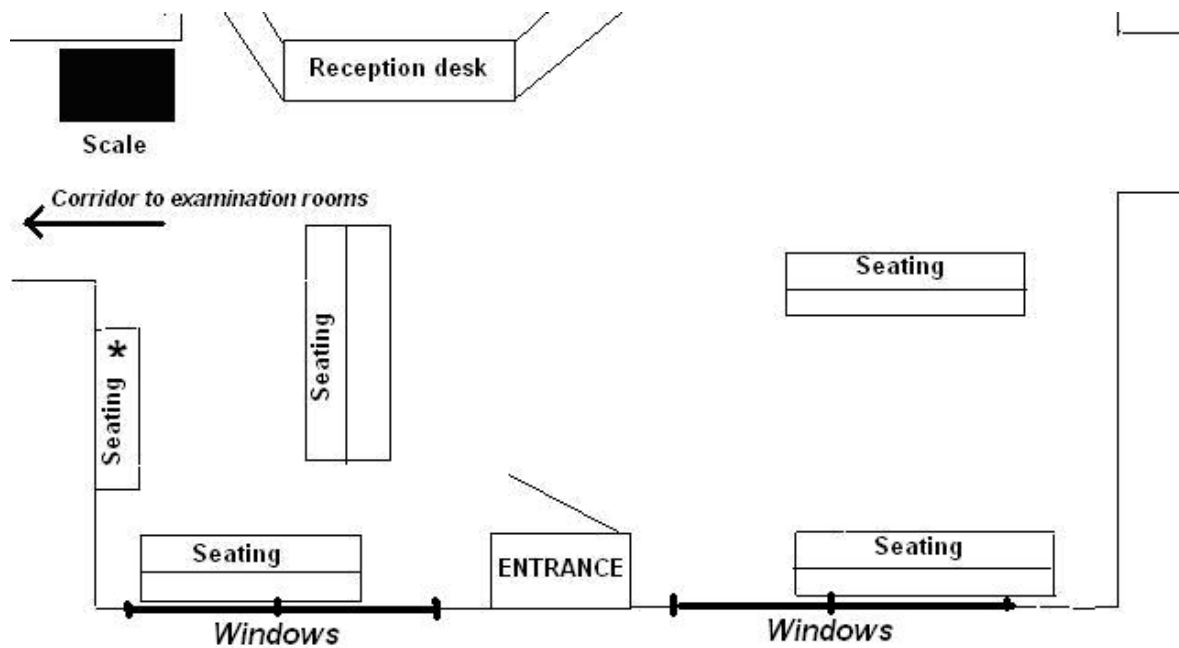


Figure 3. Waiting room area (* = the position of the observer)

sieving was performed at this stage. This was possible due to an average of two dogs in the room at the same time (maximum number of dogs in the room at the same time was five, this occurred only twice).

To classify the dogs, the booking list with each observation day's patients was studied and their reason for the visit to the clinic was noticed. The dogs were classified in two groups; single visit and revisit. The category "Single visit" meant that the reason for the visit did not indicate that the dog had been at the clinic recently, whereas in the category "Revisit" it was stated somehow in the booking list that the patient recently had been to the clinic.

Not all dogs had time in the waiting room; hence they were removed from the study, leaving a number of 110 dogs, whence 68 dogs were weighed. A number of different parameters for each dog were also recorded, including breed, gender, the reason for the visit and the gender of the dog owner.

Statistics

To detect whether the dogs' gender, the dogs' previous experience or the dog owners' gender had any impact on the dogs' stress level a number of chi-square tests were performed (d.f = 4, in all tests). To investigate if the time in the waiting room itself (WAIT) and/or the weighing itself (SCALE) had any influence on the dogs' stress value, differences between the events (ENTR-WAIT respectively WAIT-SCALE) were analyzed using a one-tailed sign test.

4. Results and discussion

Breeds and general distribution of stress value

A number of 53 different breeds were recorded, and all 10 breeds groups established by the International Kennel Club (FCI) was represented (Table 2), with a majority of dogs from group 8; (retrievers, flushing dogs and water dogs) followed by group 1 (sheepdogs and cattle dogs). Labrador retriever and German shepherd were the most common breeds with 7 dogs each, moreover 10 dogs of mixed breeds were recorded. This material is however too small for analyzing any breed or breed group differences. Furthermore only three puppies were observed during the observation period leaving a too small number for analyzing any age differences as well.

The distribution of stress values (SV) during ENTR was: SV 1 = 0%, SV 2 = 28%, SV 3 = 41%, SV 4 = 29% and SV 5 = 1,8%. The distribution of stress values during WAIT was: SV 1 = 10%, SV 2 = 43%, SV 3 = 35%, SV 4 = 11% and SV 5 = 1,8%. The distribution of stress values during SCALE was: SV 1 = 0%, SV 2 = 22%, SV 3 = 49%, SV 4 = 27% and SV 5 = 3%. Figure 4 shows the distribution of stress values regarding event and gender of the dog.

Table 2. Distribution of breed groups

Breed group	Individuals	Breeds
Group 1: Sheepdogs and Cattle Dogs	20	9
Group 2: Pinscher and Schnauzer , Molossoid Breeds, Swiss Mountain and Cattle Dogs	12	8
Group 3: Terrier	14	9
Group 4: Dachshunds	3	1
Group 5: Spitz and Primitive types	1	1
Group 6: Scenthounds and Related Breeds	2	2
Group 7: Pointing Dogs	2	2
Group 8: Retrievers - Flushing Dogs - Water Dogs	24	11
Group 9: Companion and Toy Dogs	15	9
Group 10: Sighthounds	1	1
Mixed breeds	16	-
Total number of dogs:	110	53

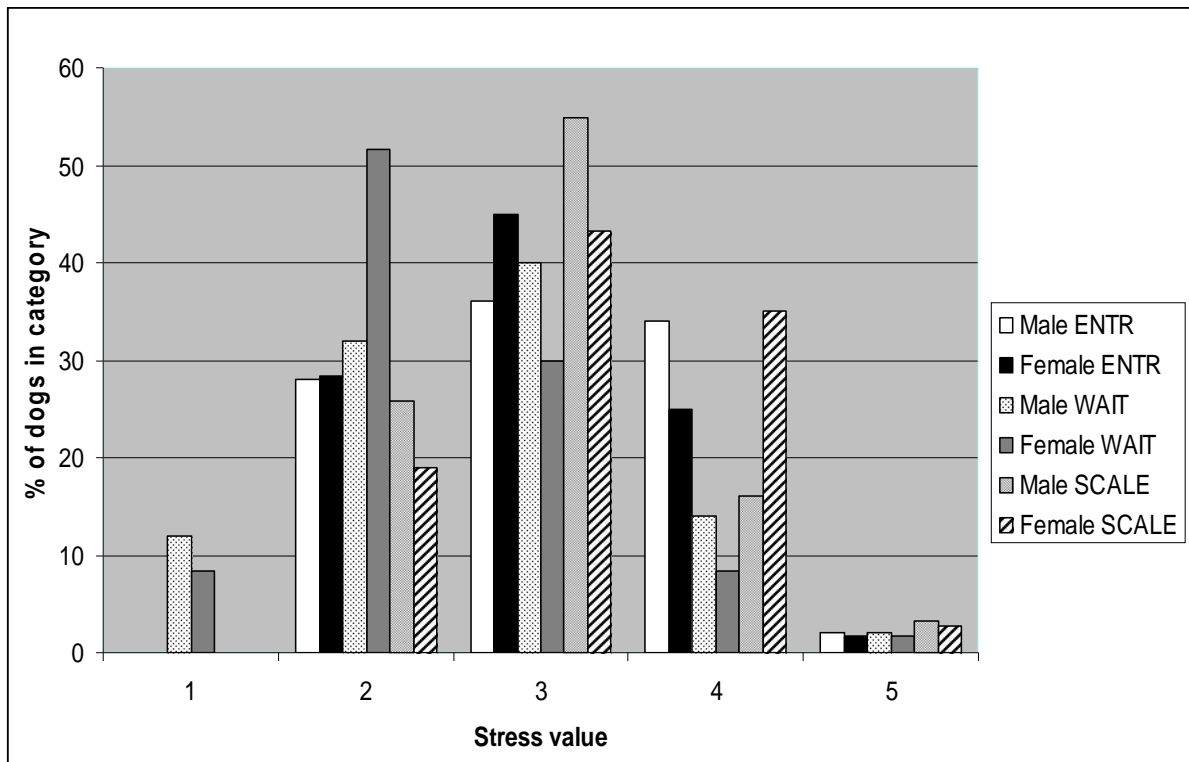


Figure 4. Distribution of stress value regarding to gender and event

The gender of the dog

The gender distribution showed a slight majority of females, with 60 females and 50 males. There was no significant difference in stress value between the genders in any of the three events (ENTR: $X^2 = 1.298$; WAIT: $X^2 = 4.448$; SCALE: $X^2 = 3.90$, n.s), suggesting females and males show an equal amount of stress in the waiting room. This is somewhat surprising due to the facts that females generally are more anxious than males (Lund et al., 1996). One could also expect males to be more stressed in the waiting room since they generally are more aggressive towards other dogs (Lund et al., 1996; Rooney & Bradshaw, 2004; Notari & Goodwin, 2007) and therefore would display more stress-related behaviours than females in this kind of environment where unfamiliar dogs is present. This seems however not to be the case.

The reason for this result might be that males and females are stressed for different reasons. Females is probably stressed mainly because of their anxious nature and males mainly because of the other dogs in the room, but the amount of stress-related behaviours was not very different between them and therefore the total stress level does not differ significantly between the genders. If the males' stress mainly depends on the other dogs in the room, the only way to prevent this is to limit the dogs' visual and audible contact with each other. How this would affect the stress level is however unknown and needs further investigation. It might not necessarily decrease the amount of stress, thus it might be even more stressful to for instance hear or smell the other dogs but not be able to see them.

The females' more anxious nature is more difficult to manage. In combination with a worried dog owner the female dog might suffer from severe stress due to fear, however in this study very few dogs displayed the highest stress levels in any of the events and these dogs was not particularly females. Severely stressed dogs were generally quite uncommon.

The gender of the dog owner

An assumption was made that the gender of the dog owner would have an impact on the dog's appearance in the waiting room. The observations were classified as four different categories with regard to the gender of the dog owner;

- Female
- Male
- Female and male (a female *and* a male dog owner together with the same dog)
- Others (meaning for instance a male and a child or two females)

The distribution of the gender of the dog owners showed a vast majority of females ($n = 60$), even the category "Female and male" ($n = 22$) was bigger than the category of single males ($n = 18$), suggesting that female dog owners more often in the ones taking responsibility for the visits at the veterinary clinic than do male dog owners (Fig. 5).

The result of the analysis showed a significant difference in stress value depending on the owner's gender during event ENTR ($X^2 = 10.169$, $p < 0.05$, Fig. 6) and a strong tendency to significant difference in event WAIT ($X^2 = 9.131$, $d.f = 4$, $p < 0.075$, Fig 7). However, in the last event, SCALE, naturally only the dog owners to the dogs who were

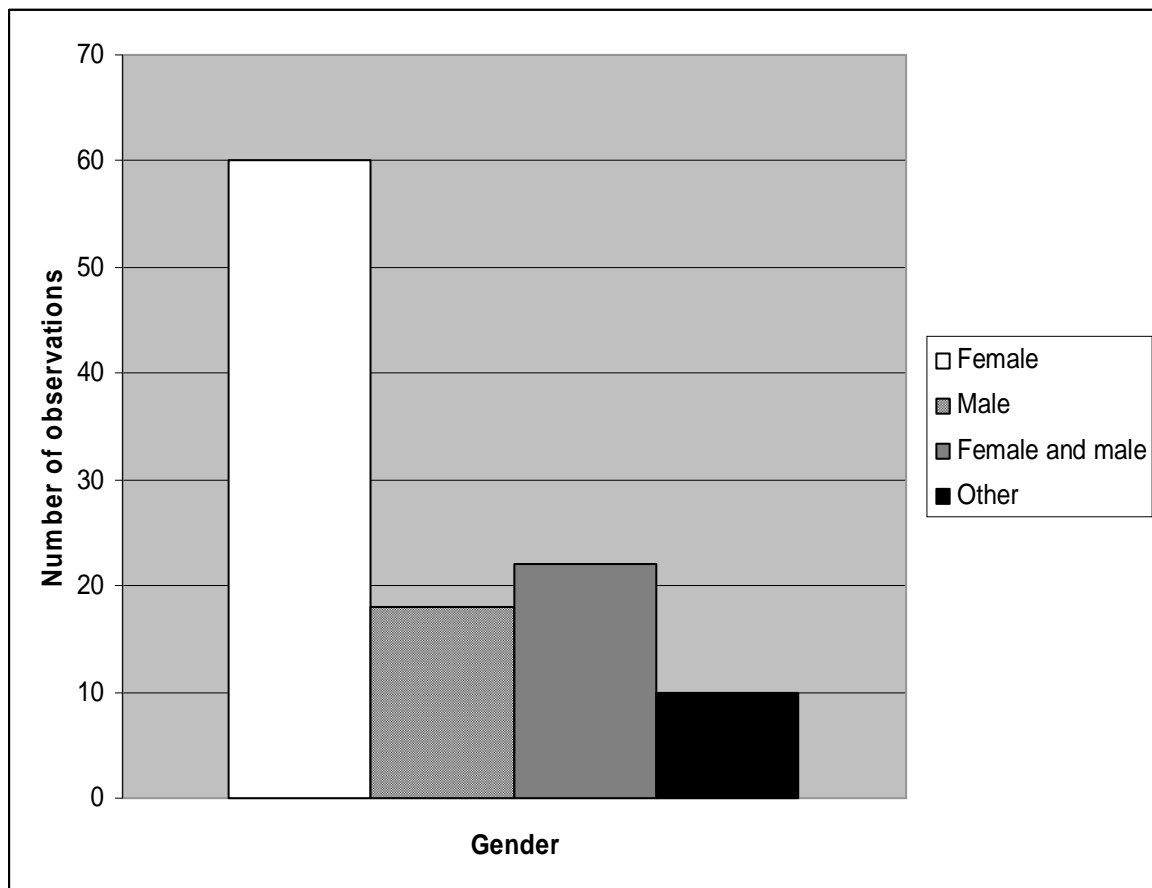


Figure 5. Distribution of gender of the dog owner

weighed could be recorded ($N = 68$), leaving a too small number of dog owners in the categories “Males” ($n = 7$) and “Others” ($n = 7$) to make a meaningful analysis.

Thus the chi-square test at least suggests there is a difference in the dogs’ stress level in the event ENTR and WAIT. However, the test does not point out where this difference lies. To find the difference one has to study figure 6 and 7.

During the event ENTR (entrance) all the gender categories peaked at stress level 3, except the category “Female and male” which peaked quite vastly at level 4. Thus this category shows more high-stress observations that expected, suggesting the dogs that came to the clinic with both their owners (female and male) was more likely to get a higher stress value, than those who arrived with a single female or male owner. In figure 6 one may also detect a difference in distribution between the categories, showing for instance that female owners has a more equal distribution (that is more equal staples) than does male owners.

In the next event, WAIT (Fig. 7), a similar pattern can be detected, where the category “Female and male” peaks at stress level 3, whereas the other categories peaks at stress level 2. This pattern was however expected since the dogs accompanied by both male and female dog owners had a higher stress value during the entrance, and therefore hardly can be expected to receive as low stress value during the wait as the other dogs. This however suggests that the higher stress value these dogs achieved during the entrance affects their stress level also during the wait. In this event the equal distribution in female dog owners detected in the previous event can not be seen, there was a more uneven distribution in this event in general.

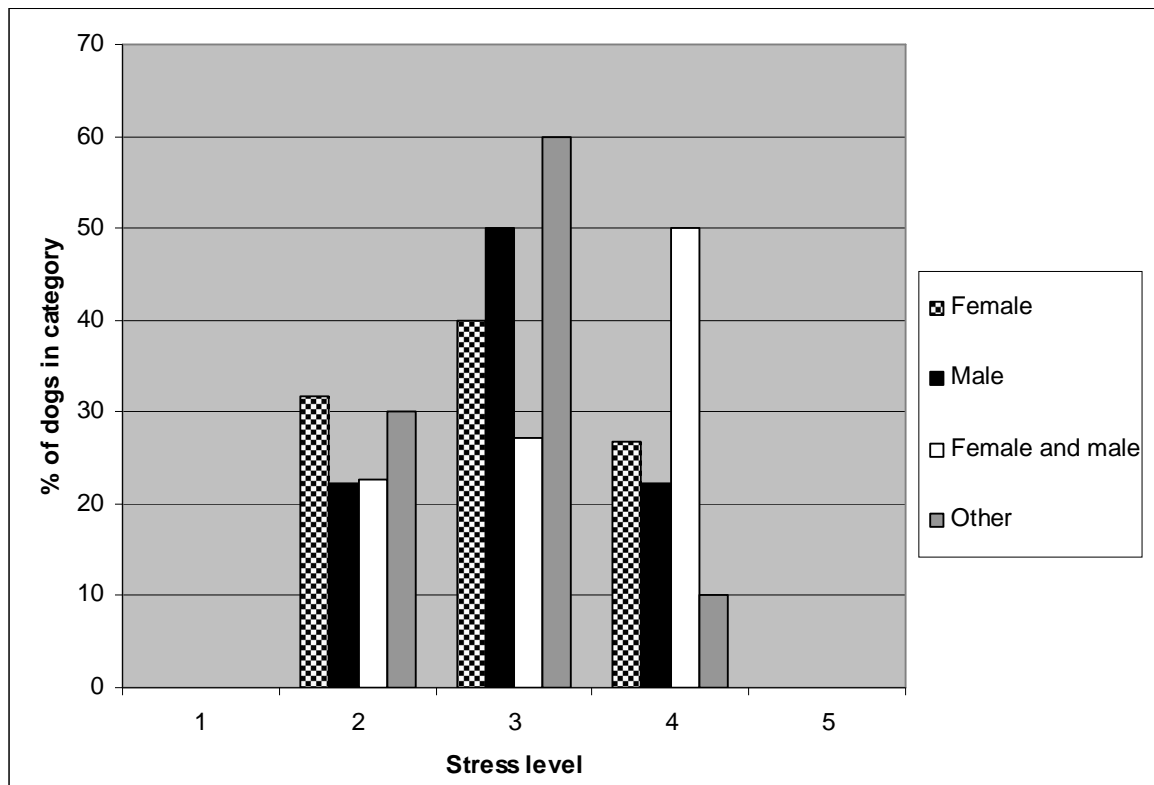


Figure 6. Stress level during entrance regarding to the gender of the dog owner ($N = 110$, $p < 0.05$)

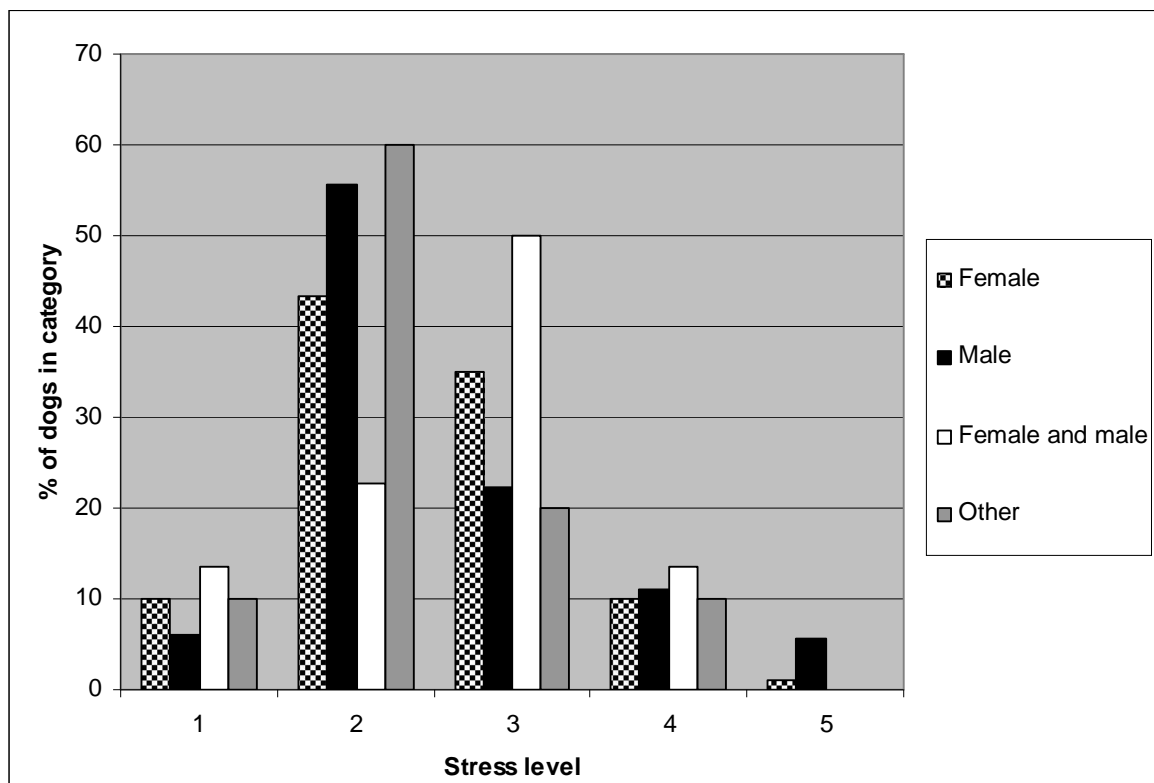


Figure 7. Stress level subsequent to time in the waiting room regarding to the gender of the dog owner ($N = 110$, $p < 0.075$)

Since the human-animal bond can be considered analogous to the parent-child bond (Topál et al., 1998) one might suspect female dog owners to have a larger impact on their dog's stress behaviour since females traditionally is considered more affective and caring of their child. This study however shows that dogs accompanied by both a female and a male dog owner were more anxious/stressed than dogs of single females. To explain this result one might consider the breed distribution between the categories to be interesting. Particularly breed group 9, which consists of companion and toy dogs, was unevenly distributed between the categories. This breed group accounted for 15% of the dogs in the "Female" category and 0% in the "Male" category, whilst "Female and male" consisted of 27% companion and toy dogs. One might suggest that dog owners with strong attachment and an indulgent attitude towards their dog might be more likely to obtain a dog from the companion and toy breed group since they are small and often very cute. This type of dog owners is probably also more likely to spoil their dog and is therefore more likely to have a dog with a more anxious and dependent nature (O'Farrell, 1997), furthermore one could expect this type of dog owners to be equally engaged in the dog's health and therefore attend the clinic together.

This result might however also depend on the reason for the visit. The dogs with both owners present might have had a more serious medical condition, thus the dog might be in pain or feeling sick, displaying more stress-related behaviour than the average dog, and the seriousness of the condition made both dog owners to attend to the visit. The data from this study does unfortunately not enable any deeper investigations in the cause of the visit in these dogs, however no apparent differences in the distribution between single visits and revisits were found, suggesting the character of the visits did not differ very much between the categories.

The subject of dogs' different responses to women and men is not very investigated and needs further research. That dogs respond differently to unfamiliar men and women has been showed (Well & Hepper, 1999), but how does the relationship to a female or a male dog owner, whom the dog knows very well, differs? And how does a couple or a whole family affect the relationship dynamics compared to a single dog owner? These questions need further investigation.

The dog's previous experience

Furthermore the assumption was made that a dog's recent experience in the veterinary clinic might influence the dog's stress related behaviour in the waiting room. The distribution showed an apparent majority of single visits ($n = 70$) compared to revisits ($n = 40$).

No significant difference was found between single visit and revisit in the events ENTR and SCALE ($X^2 = 3.40$ and $X^2 = 3.90$, respectively). However in the event WAIT there was a significant difference between single visits and revisits ($X^2 = 9.606$, $p < 0.05$, Fig. 8).

Also in this case the difference is not found until the graph of the event is studied. The figure shows that "Single visits" peaks at stress level 2, whilst "Revisits" peaks at stress level 3, suggesting that dogs with recent experiences from the veterinary clinic has a hard time relaxing in the waiting room compared to dogs with vague or no expectancies.

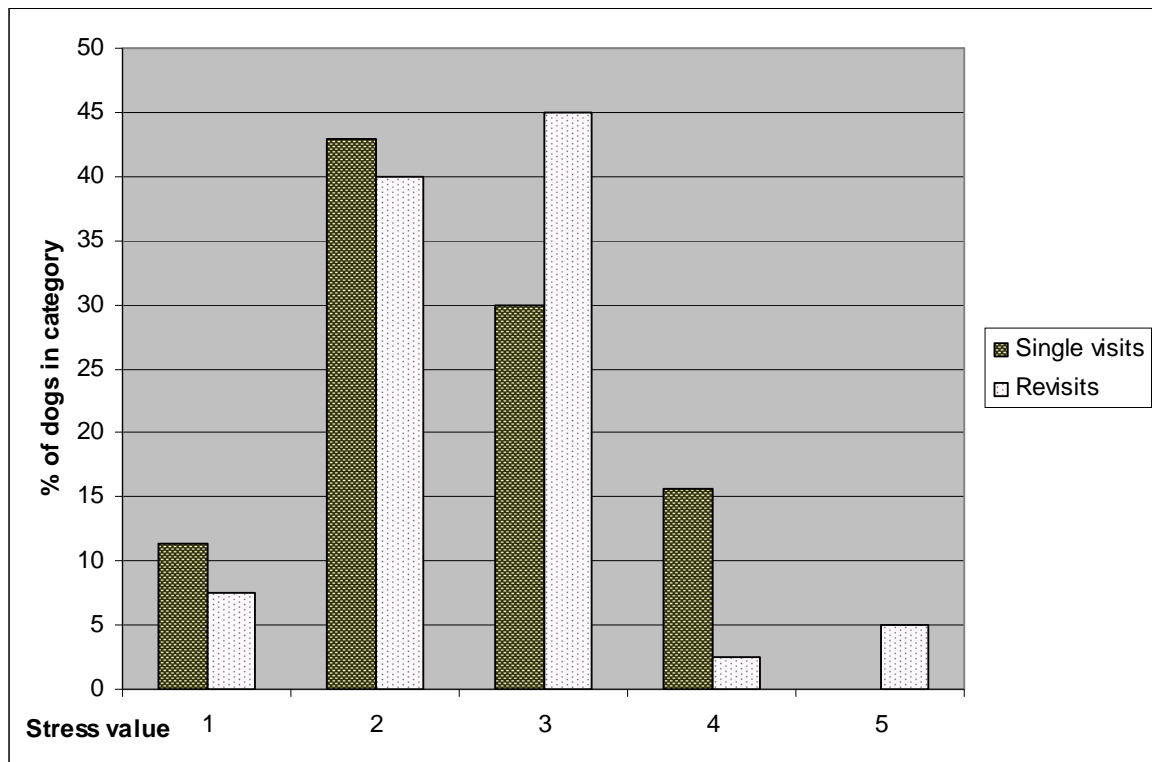


Figure 8. Stress level subsequent to time in the waiting room regarding recent experience of visits in the veterinary clinic ($N = 110$, $p < 0.05$)

This result is interesting, even though not very surprising. That a dog's previous experience of visiting the veterinary clinic affects its expectancies in the waiting room might not be a very controversial statement. However, one could discuss whether the dog is experiencing a conditioned response to the stimuli of the veterinary clinic itself, or whether it in fact is able to think forward in time and is therefore anxious since it is aware of the up-coming meeting with the veterinarian. Usually no unpleasant medical proceedings is performed in the waiting room, and the waiting area itself therefore would not be considered an obvious stress-inducing stimuli, thus it might be possible that the dogs actually are experiencing stress due to the expected veterinary procedure that will follow the time in the waiting room.

To prevent a negative experience at the clinic from becoming an unpleasant memory to the dog and to aggravate further visits in the future, the handling procedures must be as painless, rapid and effective as possible. Restraint is particularly critical since it is very stressful to the individual and the goal must be only to practice restraint when it is necessary and for as short period as possible (Lawrence, 1991). But even if the treatment or examination is ideal, the experience might become unpleasant anyhow due to stress from fear or pain.

To create a fully positive hospital environment is hardly possible, but the goal has to be to reduce all unnecessary discomfort, such as loud noises, stressed personnel and aggressive interactions with other dogs in the waiting room. Stress induced by the smell of blood has been reported in cattle (Grandin, 1980), however pigs does not seem to be stressfully affected to this stimulus since they to some extent consume blood and meat (Grandin, 1980) and it is therefore unlikely that dogs, as predators, would experience stress due to smell of blood in the animal hospital. However animals can respond to olfactory stimuli emitted by other frightened or stressed individuals (Lawrence, 1991). This has been studied in rats (Pitman et al., 1988) and is also likely to concern dogs since they have a well developed

sense of smell. This means it will be very difficult to totally eliminate all stressful stimuli in a waiting room, since the smell of other individual's stress itself may cause anxiety to the dogs in the waiting area.

The dog owner also has a major role in creating a comfortable visit, by avoiding to project negative feelings such as anxiety on the dog. It might however not be a good idea to act in an excessively peppy way either, since this might make a too big affair of the visit. In fact acting calm and unconcerned could sometimes be the most efficient way to make the dog feel secure.

Differences in stress level after the time in the waiting room

One of the aims of the study was to detect whether the time in the waiting room had any impact on the dogs' stress level. To do this the difference in stress value between the events was analyzed, thus a difference in stress between two events indicate that one of the events is more stressful than the other.

The result showed a significant difference in the tested relation between entrance and wait (ENTR-WAIT: $z = 6.63$, $p < 0.001$). The graph for the relation ENTR-WAIT (Fig. 9) displays that a vast majority of dogs (61%) showed a decrease in stress value during the time in the waiting room compared to the entrance. Very few dogs (7,2%) increased in stress level at this event, and none of them increased more than one level. Some dogs (32,7%) showed no change in stress at all between entrance and the wait, and 25,7% of

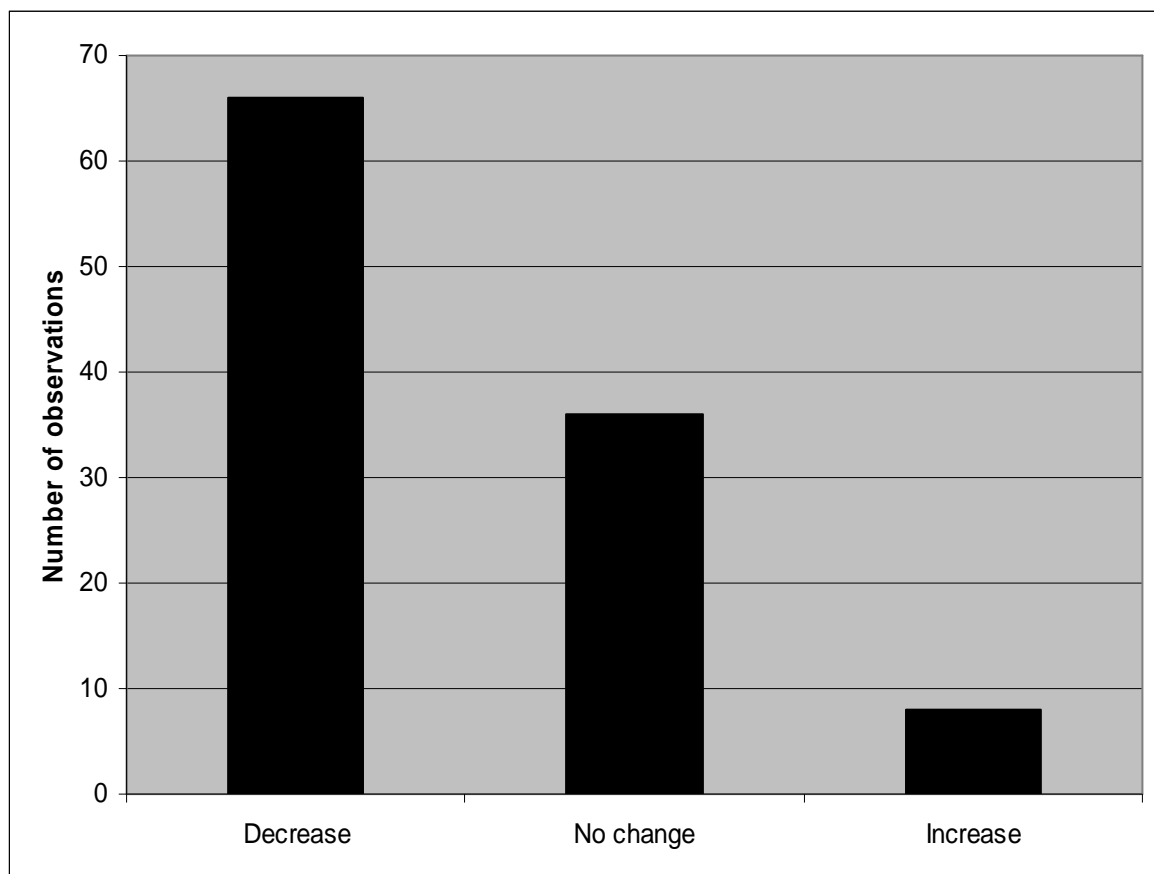


Figure 9. Change in stress between entrance and time in the waiting room (N = 110, $p < 0.001$)

these dogs kept the same stress value during the whole observation, thus in all the three events (ENTR, WAIT, SCALE).

This shows that most dogs experienced a decrease in stress subsequent to time in the waiting room compared with the stress level at the entrance. A prolonged time in the waiting room is among the most common of client complaints. The complaints are even bigger when the clients were in good time for the visit themselves (Moreau, 2005).

However this study suggests that the time in the waiting room actually is beneficial for the dogs, since they get a chance to calm down prior to meeting with the veterinarian. Very few dogs did in fact show an increase in stress during the wait, and among these dogs 75% were males. This suggests that a large proportion of the increase in stress during the waiting time might depend on the other dogs in the waiting room, since the major difference between males and females, that is relevant in this case, is that males are generally more disturbed by unfamiliar dogs. Only 3,3% of the females increased in stress during the wait, whilst 12% of the males showed an increasing stress level.

However it would perhaps not be very difficult to create a private space in every waiting room, with limited outlook, where the dog owners of stressful, and perhaps unruly male dogs, could get a chance to sit down in peace and quiet. Even if most owners of such dogs perhaps would not admit to the need of such a space, the dogs themselves would probably benefit from a space of this sort since they might achieve a calmer state previous to meeting with the veterinarian. However though the other dogs in the room seem disturbing to some of the male dogs, the amount is so low that any general suggestions to prevent this might not be necessary.

How much time a dog needs to decrease in stress is of course dependent of the individual, but my opinion is that most dogs calm down rather quickly. However to recommend a minimum time in the waiting room one has to evaluate the effects of different waiting times, even though from observing this large amount of dogs in the waiting room my assumption would be that most dogs need to sit down at least 15-20 minutes in the waiting room to be considerably relaxed. No upper limit could be detected during the observations, actually quite the contrary, a very long wait (>40-45 min) seemed even more effective on the dog's stress value.

The weighing's impact on the dogs' stress value

To detect if the weighing was a stressful experience to the dogs or not, the stress value from the time in the waiting room was compared to the stress value at the scale, since almost exclusively all dogs who were weighed were brought to the scale when their name was called to meeting with the veterinarian, thus subsequent to the wait.

The result showed a significant difference between the events (WAIT-SCALE; $z = 3.79$, $p < 0.001$). The graph of the relation WAIT-SCALE (Fig. 10) displays a similar pattern as in the graph over ENTR-WAIT, but in the opposite way. More than half of the dogs (53%) showed an increase in stress value during the weighing compared to the wait. However also in this event some dogs (32%) showed no change in behaviour and therefore kept the same stress value during the weighing and a few dogs (14,7%) showed a decrease in stress value.

This suggests that being weighed in these circumstances is a stressful event for most dogs. To prevent the dog's stress level from rising previous to the meeting with the veterinarian, the weighing should not be performed when the dog's name is called up and it is time to enter the examination room. An alternative proceeding would be for the staff at

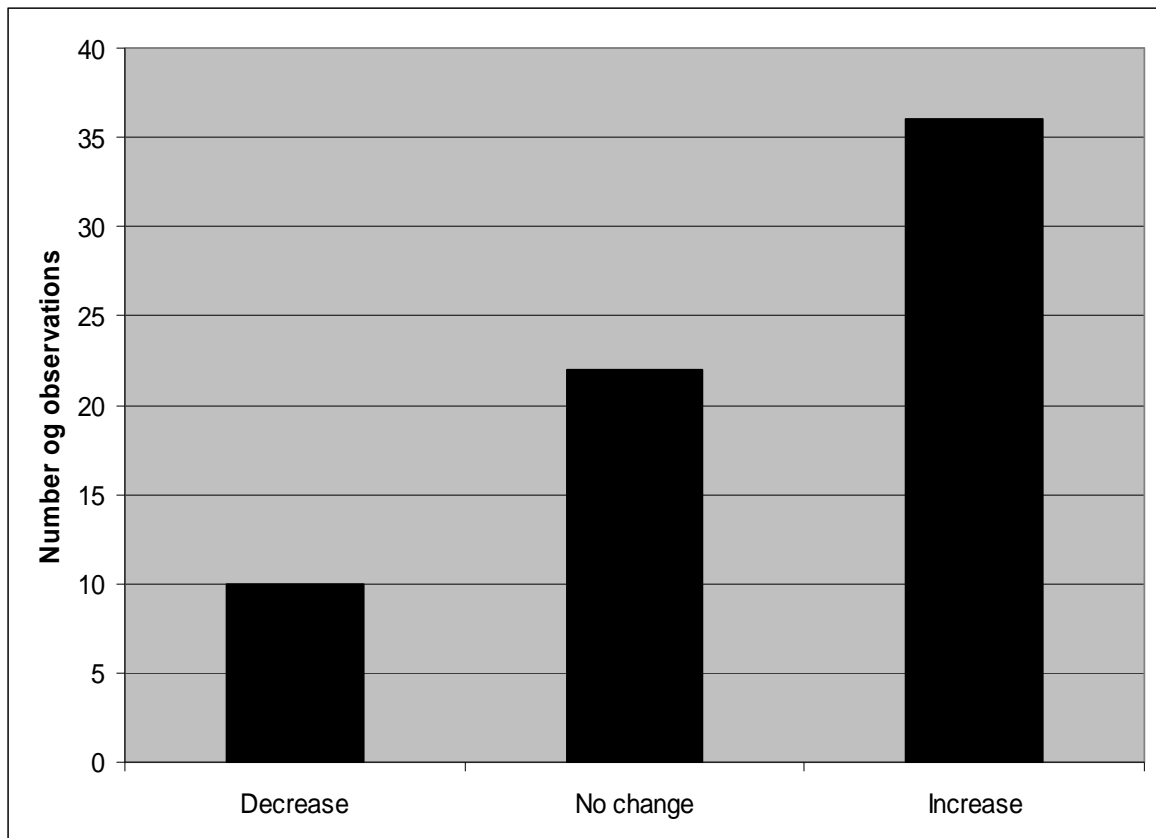


Figure 10. Change in stress between the wait and weighing ($N = 68$, $p < 0.001$)



Figure 11. A working kelpie male on the scale. Photo: Andreas Hernander Brand

the reception desk to urge the dog owner to weigh the dog before they go to sit down and wait. This would not be difficult, most dog owners were not even aware of the scale and that their dog was going to be weighed, but once the scale was presented to them they immediately weighed the dogs. However this was too often on the way to the examination room, creating a tensed and suspicious dog just in time for the examination.

If the weighing instead would be performed close in time to the entrance when the dog already has a rather high stress level and then were allowed to sit down continuously until showed to an examination room, the dog would probably be more relaxed when meeting the veterinarian and it might also make the clinical procedures easier to perform.

Not all dogs showed this pattern, but a vast majority of them did. Hence this simple procedure of weighing the dogs right after the registration at the reception desk instead of prior to the examination could increase the well-being of a substantial number of dogs.

General discussion

How a dog is responding to the waiting room environment is dependent on a lot of parameters, of which many is described in the introduction to this paper. However, ethology in veterinary practice is not very well investigated and much more research is needed in this topic. Most dogs (and other animals) meet with the veterinarian several times during a life time, in many cases annually due to vaccination etc. Small animals such as dogs and cats almost exclusively meets the veterinarian at a veterinary practice or clinic, meaning they are leaving their safe home environment to enter a facility with strange odors, noises and unfamiliar animals, often in combination with sickness or injury. This is of course not the ideal environment for relaxation. However, do we have to feel content with the stressful situation that is actually present in most waiting rooms? By small means such as the ones suggested in this paper the waiting room area could be less unpleasant.

When designing a waiting room one has many requirements to consider. The space has to be proper for the dog owners as well as for the dogs and for the staff. The flooring is important since a slippery floor will create a tensed and anxious dogs (Hydbring-Sandberg et al., 2004), but the floor should also be easily cleaned. My opinion is however that the flooring often is too slippery, not only for the dogs but also for the dog owners, who on a slippery floor easily get dragged away by a large and unruly dog, especially during the wet season when people enters the clinic with wet shoes.

About 15 minutes is considered by the dog owners as an acceptable waiting period, and the accepted period is generally shorter in urban cities than on the country (Moreau, 2005). The results of the study presented in this paper suggests the waiting time is important to most dogs and one should therefore not strive to erase the wait altogether. However the complaints on long waiting time rapidly increases if the waiting room is inappropriate for waiting, e.g. if there is nothing to read or the seats are uncomfortable (Moreau, 2005).

To start with, the term “waiting room” has a rather negative sound to it, and could be replaced with for instance “welcome area” or “reception room” to avoid the clients to associate the area with a long wait. To make the waiting room more inviting and the wait less tiresome information posters, merchandise, a TV-screen and perhaps a children’s area could be included in the same space. Aquariums are commonly used in humane hospitals, but are rarely seen in veterinary clinics’ waiting rooms. It’s a shame since aquariums has proven to have a positive effect on the heart rate in stressed people, and even a videotape of an aquarium lowers the heart rate of the viewer (Wells, 2005). Even if the dogs don’t pay any attention towards the aquarium, it might help a worried dog owner to relax.

Another way of making the waiting room more welcoming is to post photographs and letters from previous patients for the new clients to read. It might give some hope to a worried owner and helps create a familiar and cheerful atmosphere.

It is important to place attention requiring objects, such as a board with photographs or a TV-screen with information, in the direction to where the patient will be called, since people does not want to direct their attention in the opposite way (Moreau, 2005), and the information might therefore otherwise go unnoticed. The clients also enjoy some insight in the clinic's activities, why some back-stage photos or a systematic overview-map over the clinic area will be highly appreciated (Moreau, 2005).

To care for the patient's and the client's experience from the moment they enter the veterinary clinic throughout the whole visit will not only give the clinic a good reputation but also facilitate the clinic's efficacy. Experiences in the waiting area is critical to whether a relaxed and appeased owner and a cooperative dog will enter the examination room, and is therefore crucial to the possibility for a good clinical examination to be obtained (BSAVA Congress, 2006).

It is not only the dog's welfare in the waiting room that should be considered. It is equally important to respect the needs of cats and other animals. For instance cats are more comfortable when their cages or baskets are placed at a raised level instead of on the floor (BSAVA Congress, 2006). The cat owner might not be aware of this fact, and the staff at the reception desk could easily direct the cat owner where to put the cage, given there is such a space. It has also been shown that predators and prey should preferably be placed in different waiting areas, and ideally even cats and dogs should be separated (BSAVA Congress, 2006). This might not be possible in many veterinary practices, but it is very important to be aware of the problem, one could for instance dedicate one day a week to "cat only"-consulting times or "small furry only"-consulting times.

In summary animal behaviour in the actual context of the veterinary clinic needs much further research. Not many papers has been posted on the subject, however I believe there is a need to investigate the veterinary practice proceedings with regard to animal behaviour and welfare. I sometimes get the impression that veterinary facilities is considered "holy land" regarding to animal needs, however the veterinary education, at least in Sweden, is a purely medical education and it teaches very little ethology and animal welfare with regard to behavioural parameters. Therefore my opinion is that there is a need even for veterinary facilities to consult animal behaviourists when planning their clinical activity and when planning the hospital buildings. My belief is that the best way to satisfy the different needs of animals is to combine the competence from all animal related professions, and thus obtain a humble attitude towards each other's experiences, not only for the sake of developing the

different professions' efficacy, but mainly for the sake of the animal's well-being.



Figure 12. Veterinary nurse Lovisa Bång at Södra Djur-sjukhuset in Stockholm is examining the collie Bamses's mouth after a car accident. Photo: Alexandra Svensson Lindén

5. References

- Appleby D.L., Bradshaw J.W.S., Casey R.A., 2002 *Relationship between aggressive and avoidance behaviour by dogs and their experience in the first six months of life*, Veterinary Record 150, 434-438
- Bamberger M., Houpt K.A., 2006 *Signalment factors, comorbidity and trends in behavior diagnoses in dogs: 1644 cases (1991-2001)* Journal of the American Veterinary Medical Association 229 (10), 1591-1601
- Broom D.M., Johnson K.G., 1993 *Stress and animal welfare* Chapman & Hall, London, UK, ISBN: 0412395800, pp. 30-34
- BSAVA Congress, British Small Animal Veterinary Association Congress, 2006 *Welfare in the waiting room and beyond* the Veterinary Record 158 (17), 577-579
- Diverio S., Tami G., Barone A., 2008 *Prevalence of aggression and fear-related behavioural problems in a sample of Argentine Dogs in Italy* Journal of Veterinary Behaviour 3, 74-86
- Ennik I., Liinamo A-E., Leighton E., van Arendonk J., 2006 *Suitability for field service in 4 breeds of guide dogs* Journal of Veterinary Behaviour 1, 67-74
- Fédération Cynologique Internationale, 2008 *Regulations for FCI Dog Shows* Fédération Cynologique Internationale, Place Albert 1, 13, B-6530 Belgium, [online]: http://www.fci.be/uploaded_files/ (2008-05-08)
- Galac S., Knol B.W., 1997 *Fear-motivated aggression in dogs: patient characteristics, diagnosis and therapy* Animal Welfare 6, 9-15
- Godbout M., Palestini C., Beauchamp G., Frank D., 2007 *Puppy behaviour at the veterinary clinic: A pilot study* Journal of Veterinary Behaviour 2, 126-135
- Goddard M.E., Beilharz R.G., 1985 *Individual variation in agonistic behaviour in dogs* Animal Behaviour 33, 1338-1342
- Grandin T., 1980 *Livestock behaviour as related to handling facilities design* International Journal for the Study of Animal Problems 1, 33-52
- Holton L., Reid E.M., Scott P., Pawson P., Nolan A., 2001 *Development of a behaviour-based scale to measure acute pain in dogs* the Veterinary Record 148, 525-531
- Hydbring-Sandberg E., von Walter L.W., Höglund K., Svartberg K., Swenson L., Forkman B., 2004 *Physiological reactions to fear provocation in dogs* Journal of Endocrinology 180, 439-448
- Lawrence A.B., 1991 *Introduction: the biological basis of handling animals*, In *Practical Animal Handling* Edited by R.S. Anderson and A.T.B. Edney, Pergamon Press, Oxford, UK, ISBN: 9780080361529, pp. 1-13
- Le Boeuf B.J., 2006 *Copulatory and aggressive behaviour in pre-puberally castrated dog* Hormones and Behavior 1 (2), 127-136
- Lund J.D., Agger J.F., Vestergaard K.S., 1996 *Reported behaviour problems in pet dogs in Denmark: age distribution and influence of breed and gender* Preventive Veterinary Medicine 28, 33-48
- Martin F., Taunton A., 2006 *Perceived importance and integration of the human-animal bond in private veterinary practice* Journal of the American Veterinary Medical Association 228 (4), 522-527
- Mellor D.J., Cook C.J., Stafford K.J., 2000 *Quantifying some responses to pain as a stressor* In *The biology of animal stress – the principles and implications for animal welfare* Edited by Moberg G.P. and Mech J.A., CABI Publishing, Wallingford, UK, ISBN: 0851993591, pp. 171-198

- Mills D.S., Ramos D., Estelles M.G., Hargrave C., 2006 *A triple blind placebo-controlled investigation into the assessment of the effect of Dog Appeasing Pheromone (DAP) on anxiety related behaviour problems in the veterinary clinic* Applied Animal Behaviour Science 98, 114-126
- Moberg G.P., 2000 *Biological responses to stress: Implications for animal welfare* In *The biology of animal stress – the principles and implications for animal welfare* Edited by Moberg G.P. and Mech J.A., CABI Publishing, Wallingford, UK, ISBN: 0851993591, pp. 1-21
- Moreau P., 2005 *Communication tools for veterinary practices. Part two: from the waiting zone to the exit* the European Journal of Companion Animal Practitioners 15 (1), 89-97
- Notari L. & Goodwin D., 2007 *A behaviour test on German Shepherd dogs: heritability of seven different traits* Applied Animal Behaviour Science 79, 113-132
- O'Farrell V., 1997 *Owner attitudes and dog behaviour problems* Applied Animal Behaviour Science 52, 205-213
- Ogata N., Kikusui T., Takeuchi Y., Mori Y., 2006 *Objective measurements of fear-associated learning in dogs* Journal of Veterinary Behaviour 1, 55-61
- Pageat P & Gaultier E., 2003 *Current research in canine and feline pheromones* Veterinary Clinics of North America - Small Animal Practice 33 (2), 187-211
- Pal S.K., Ghosh B., Roy S., 1999 *Inter- and intra-sexual behaviour of free-ranging dogs (Canis familiaris)* Applied Animal Behaviour Science 62 (2-3), 267-278
- Pitman D.L., Ottenweller J.E., Natelson B.H., 1988 *Plasma corticosterone levels during repeated presentation of two intensities of restraint stress: Chronic stress and habituation* Physiology and Behaviour 43 (1), 47-55
- Plutchik R., 1999 *Individual and Breed Differences in Approach and Withdrawal in Dogs* Behaviour 40 (3-4), 302-311
- Podberscek A.L. & Serpell J.A., 1997 *Aggressive behaviour of English cocker spaniels and the personality of the owner* the Veterinary Record, July 19, 73-76
- Rooney N.J., Bradshaw J.W.S., 2004 *Breed and sex differences in the behavioural attributes of specialist search dogs – a questionnaire survey of trainers and handlers* Applied Animal Behaviour Science 86, 123-135
- Ruefenacht S., Gebhart-Henrich S., Miyake T., Gaillard C., 2002 *A behaviour test on German Shepherd dogs: heritability of seven different traits* Applied Animal Behaviour Science 79, 113-132
- Rugbjerg H., Friis Proschowsky H., Kjær Ersbøll A., Lund J.D., 2003 *Risk factors associated with interdog aggression and shooting phobias among purebred dogs in Denmark* Preventive Veterinary Medicine 58 (1-2), 85-100
- Seksel K., Mazurski E.J., Taylor A., 1999 *Puppy socialisation programs: short and long term behavioural effects* Applied Animal Behaviour Science 62, 335-34
- Shyan M.R., Fortune K.A., King C., 2003 *Bark Parks – A study on Interdog Aggression in a limited-control environment* Journal of Applied Animal Welfare Science 6 (1), 25-32
- Stanford T.L., 1981 *Behaviour of dogs entering a veterinary clinic* Applied Animal Ethology 7 (3), 271-279
- Svartberg K., 2002 *Shyness-boldness predicts performance in working dogs* Applied Animal Behaviour Science 79, 157-174
- Svartberg K., 2005 *A comparison of behaviour in test and in everyday life: evidence of three consistent boldness-related personality traits in dogs* Applied Animal Behaviour Science 91, 103-128

- Svartberg K., 2006 *Breed-typical behaviour in dogs – Historical remnants or recent constructs?* Applied Animal Behaviour Science 96, 293-313
- Svartberg K., Forkman B., 2003 *Personality traits in the domestic dog (Canis familiaris)* Applied Animal Behaviour Science 79, 133-155
- Svartberg K., Tapper I., Temrin H., Radesäter T., Thorman S., 2005 *Consistency of personality traits in dogs* Animal Behaviour 69, 283-291
- Svenska Brukshundklubben, 2007 *Anvisningar Mentaltest* [online]: <http://www.sbk.nu/4775.epibrw> (2008-05-08)
- Takeuchi Y., Ogata N., Houpt H.A., Scarlett J.M., 2001 *Differences in background and outcome of three behaviour problems in dogs* Applied Animal Behaviour Science 70, 297-308
- Topál J., Miklósi A., Csányi V., 1997 *Dog-human relationships affects problem solving behaviour in the dogs* Anthrozoos 10 (4), 214-224
- Topál J., Miklósi A., Csányi V., Dóka A., 1998 *Attachment behaviour in dogs (Canis familiaris): A new application of Ainsworth's (1969) Strange situation test* Journal of Comparative Psychology 112 (3), 219-229
- USPTO, United States Patent and Trademark Office, 1999 *Animal Separators for Waiting rooms* Patent Number: 5,988,122. Barcode: US005988112A, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
- Wells D.L., 2005 *The effect of videotapes of animals on cardiovascular responses to stress* Stress and Health 21 (3), 209-213
- Wells D.L., Hepper P.G., 1999 *Male and female dogs respond differently to men and women* Applied Animal Behaviour Science 61, 341-349
- Wilsson E., Sundgren P-E., 1997 *The use of a behaviour test for the selection of dogs for service and breeding, I: Method of testing and evaluating test results in the adult dog, demands on different kinds of service dogs, sex and breed differences* Applied Animal Behaviour Science 53, 279-295
- Wolfe T.L., 2000 *Understanding the role of stress in animal welfare: Practical Considerations* In *The biology of animal stress – the principles and implications for animal welfare* Edited by Moberg G.P. and Mech J.A., CABI Publishing, Wallingford, UK, ISBN: 0851993591, pp. 355-368